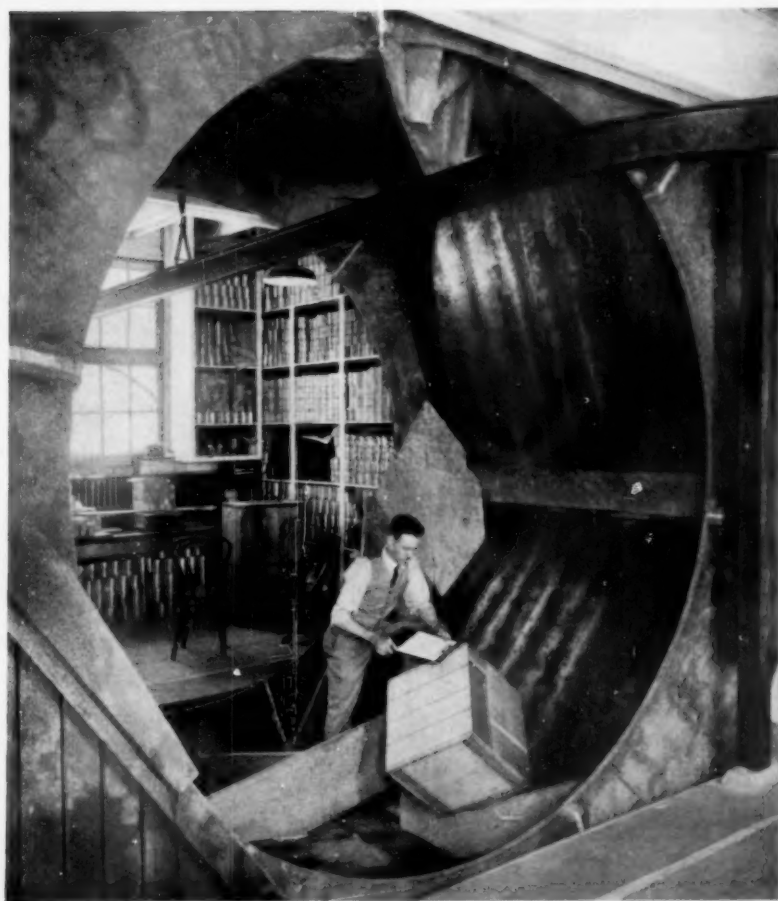


DEC 19 1933

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE.



DECEMBER 16, 1933

**Mechanical Baggage Man**

See Page 392

## SCIENCE NEWS LETTER

VOL. XXIV

No. 662

The Weekly  Current  
Summary of Science

Published by

## SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—\$5.00 a year postpaid; two years \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

Canadian and foreign subscribers please add two dollars (\$2.00) per year to regular subscription rates to cover postage.

In requesting change of address, please give your old address as well as the new one in notification to Circulation Department, SCIENCE NEWS LETTER, 21st and Constitution Ave., Washington, D. C., at least two weeks before change is to become effective.

Advertising rates furnished on application.

## Board of Trustees of Science Service

Honorary President, William E. Ritter, University of California. Representing the American Association for the Advancement of Science, J. McKen Cattell, President, Editor, Science, Garrison, N. Y.; Burton E. Livingston, Johns Hopkins University, Baltimore, Md.; Raymond Pearl, Director, Institute for Biological Research, Johns Hopkins University, Baltimore, Md. Representing the National Academy of Sciences, W. H. Howell, Vice-President and Chairman of Executive Committee, Johns Hopkins University, Baltimore, Md.; R. A. Millikan, Director, Norman Bridge Laboratory of Physics, California Institute of Technology, Pasadena, Calif.; David White, Senior Geologist, U. S. Geological Survey. Representing National Research Council, Vernon Kellogg, Secretary Emeritus, National Research Council, Washington, D. C.; C. G. Abbot, Secretary, Smithsonian Institution, Washington, D. C.; Harrison E. Howe, Editor of Industrial and Engineering Chemistry. Representing Journalistic Profession, John H. Finley, Associate Editor, New York Times; Mark Sullivan, Writer, Washington, D. C.; Marlen E. Pew, Editor of Editor and Publisher, New York City. Representing E. W. Scripps Estate, Harry L. Smithton, Treasurer, Cincinnati, Ohio; Robert P. Scripps, Scripps-Howard Newspapers, West Chester, Ohio; Thomas L. Sidlo, Cleveland, Ohio.

## Staff of Science Service

Director, Watson Davis; Staff writers: Frank Thone, Emily C. Davis, Jane Stafford, Marjorie Van de Water, J. W. Young; Librarian, Minna Gill; Sales and Advertising Manager, Hallie Jenkins.

Copyright, 1933, by Science Service, Inc. Reproduction of any portion of the SCIENCE NEWS LETTER is strictly prohibited since it is distributed for personal, school, club or library use only. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service, details and samples of which will gladly be sent on request.

Members of the American Association for the Advancement of Science have the privilege of subscribing to the SCIENCE NEWS LETTER at the reduced price of \$3 per year. Application for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A. A. S., Smithsonian Institution Building, Washington, D. C.

Publication Office, 1930 Clifton Ave., Baltimore, Md., Editorial and Executive Office, Constitution Ave. at 21st St., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienservc, Washington. Entered as second class matter October 1, 1926, at the post-office at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. and Canadian Patent Offices.

## DO YOU KNOW?

A common pigweed plant may yield as many as 117,000 seeds.

The turkey, an American bird, was carried to Europe in 1519 by a Spanish explorer.

A chemical preparation is being substituted for a hot iron in branding cattle in Germany.

It is estimated that 20 per cent. of the poverty in normal times is attributable to chronic illness.

Wood gas may be employed as a motor fuel in Czechoslovakia, if tests prove successful.

John Mayow of England published in 1674 the first comprehensive treatise on the atmosphere.

Government scientists have developed a method of determining in advance the relative effects of age on different types of paper.

The depth to which metal is "bruised" when the surface is machined can be detected by X-rays.

The oldest drug prescription known is a stone tablet of 3700 B. C. bearing directions for making an inhalant for treating a head cold.

A warm bathing beach in Poland was transformed into a winter scene one day when carbon dioxide shot up from an oil well and descended in the form of snow.

A bird-killing spider with an eight-inch leg spread is described by Dr. R. L. Ditmars, of the New York Zoological Park, who observed it in tropical America.

Quinine bark was named chinchona in honor of the Countess Chinchon, but the botanist Linnaeus wrote the word without the first h, and it has been scientifically misspelled, "cinchona," ever since.

## WITH THE SCIENCES THIS WEEK

## ANTHROPOLOGY

Did Stone Age man live in a cave? p. 393.

## ARCHAEOLOGY

When was cannibalism practised in Britain? p. 393.

Where is the Lost City of Nevada? p. 387.

What trace remains of the Indians who lived in the Everglades before the Seminoles? p. 389.

## ASTRONOMY

Why is life considered impossible on most of the planets? p. 391.

## CRIMINOLOGY

What evidence does a revolver leave upon the person who uses it? p. 388.

## ENGINEERING

How many people drive faster than 55 miles per hour? p. 387.

Why does a railway roadbed have to be washed? p. 391.

## GENETICS

Is goiter hereditary? p. 388.

## MATHEMATICS

Can truth be three-sided and still be logical? p. 397.

## MEDICINE

What may explain the increase in the diabetes death rate? p. 396. *Diabetes*—Benjamin F. Smith—Appleton, 1930, \$2.

## METEOROLOGY

Are the winters becoming less severe? p. 390.

## NEUROLOGY

What is sleep? p. 392.

## OCEANOGRAPHY

How much food does a cubic meter of "ocean soup" contain? p. 394. *Biological Chemistry and Physics of Sea Water*—H. W. Harvey—Macmillan, 1928, \$4.25.

## ORNITHOLOGY

Which are the poets' favorite birds? p. 392.

## PALEONTOLOGY

When did beaver as big as bear live in North America? p. 393.

## PHYSICS

How much does a pound of "heavy water" cost now? p. 387.

## PHYSIOLOGY

How do weight-reducing drugs cause the body to lose weight? p. 397.

## PSYCHOLOGY

How does the little piccaninny respond to a drum? p. 398.

## PSYCHOLOGY—ENGINEERING

Does "very moderate drinking" by automobile drivers increase the probability of accident? p. 390 and 387. *Alcohol and Human Efficiency*—Walter R. Miles—Carnegie Inst. of Washington, 1924, \$3.

## PUBLIC HEALTH

Are teen-age girls more susceptible to tuberculosis than boys? p. 392.

## TESTING MATERIALS

Where are the jolts of a 1000-mile journey concentrated into ten minutes? p. 392.

## ZOOLOGY

What pest has invaded Australia from Europe? p. 391.

Where was the home of the Norway rat? p. 399. *Uninvited Guests*—David Causey—Knopf, 1932, \$2.

*These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information for the article, but are references for further reading. Books cited can be supplied by Book Dept., Science News Letter, at publishers' prices, prepaid in the United States.*

## ENGINEERING

# Speed of Average Driver on Highway Found to Be 35 m.p.h.

Ordinary Traffic Moves Best Without Lights or Policemen; Alcohol Held Part Cause of One-Third of Fatal Accidents

A "SPEED detector" spying on motorists driving along the roads of Maryland revealed that the average speed of the 41,000 vehicles observed was 35.5 miles an hour, members of the Highway Research Board meeting in Washington learned from a report by Prof. A. N. Johnson of the University of Maryland.

The speed detector consists mainly of a square box containing a mirror. When you drive by it a reflection is flashed to an observer stationed a measured distance down the road. He then times you until you cover the distance to him.

Eight per cent. of the vehicles were going only 15 to 25 miles an hour, Prof. Johnson said. Only 1 per cent. traveled over 55 miles an hour; 12 per cent. between 45 and 55; 43 per cent. between 35 and 45; and 36 per cent. between 25 and 35 miles per hour.

Ordinary traffic, not including that of rush hours, gets along with least delay when there are no lights or policemen at the intersection, it was revealed by tests reported by E. H. Holmes, of the U. S. Bureau of Public Roads.

Of the various means for controlling traffic, the policeman caused the least delay, but the lights, when changed rapidly, and when operated by the traffic itself, were nearly as efficient.

Drinking of alcoholic beverages interferes with driving ability in four different ways, Dr. Walter R. Miles, of the Institute of Human Relations, Yale University, told the Board.

"A man may keep his car right side up and on the road when he is too intoxicated to walk, but this fact is not reassuring to others on the highway," Dr. Miles said.

Although alcohol is generally thought of as a stimulant, and gives the feeling of stimulation to the person drinking it, its real effect is depressing on most of the functions of the body, he pointed out. The driver who has been drinking gives a poorer grade of attention to what is going on around him, including other traffic and traffic

signals. His eyes, hands, and feet are slower to respond. His muscular responses are less dependable, more variable. But he has an increased self-assurance which prompts him to assume the right of way and be willing to take a chance.

"Although alcohol is directly mentioned in only 7 to 10 per cent. of fatal highway traffic accidents, it is the belief of informed traffic officials that one-third of such accidents are at least partly chargeable to use of alcohol by the driver," Dr. Miles said.

Two pounds of calcium chloride treated sand or cinders to each square yard of pavement, is the recipe recommended for icy highways, by the Committee on Maintenance of the Highway Research Board. For city streets, two pounds of that salt alone should be used per square yard, and the resulting slush removed as soon as practicable.

*Science News Letter, December 16, 1933*

## ARCHAEOLOGY

## Speedy Action Rescues Relics Of "Lost City"

ARCHAEOLOGICAL treasures of the so-called Lost City of Nevada, doomed to be lost indeed beneath the water impounded by Boulder Dam, are to be rescued for posterity, at least in part, through the combined forces of the National Park Service, the Southwest Museum of Los Angeles and the Civilian Conservation Corps.

The arrangements were made through efforts of Congressman J. G. Scrugham of Nevada, who, when Governor of his State, was responsible for the discovery of this important group of Early Pueblo ruins. The present project is in charge of M. R. Harrington, of the Southwest Museum, who led the first expedition to work on the site in 1924-26, at Governor Scrugham's invitation. Work began November 15, and is slated to continue until about May 1.

The old city, occupied some fifteen

hundred years ago, was unusually large, for its ruins can be traced along the Muddy River near Overton for a distance of nearly five miles. The houses were built mostly of adobe, or of alternate layers of adobe and stone, and were only one story high. One, however, contained more than fifty rooms. In exposed situations the walls had weathered down to the foundations, but where protected by sand-dunes standing walls four or more feet high were found.

The first expedition uncovered many skeletons of the ancient people, and collected many fine specimens of artistically decorated pottery.

*Science News Letter, December 16, 1933*

## PHYSICS

## Pound of "Heavy Water" Being Manufactured

IN A FEW WEEKS, there will be at Columbia University a supply of about 400 grams (approximately a pound) of heavy water, similar to familiar ordinary water but with practi-



### YIELDS HEAVY WATER

The U. S. Bureau of Standards has found that razorite (native borax tetrahydrate) from Southern California, a crystal of which is shown above, contains chemically bound water heavier than normal by seven parts per million. Razorite was probably deposited from the last mother liquors remaining after the complete evaporation of an ancient sea. With special laboratory evaporating equipment, heavy water with a density difference of forty parts per million has been quickly obtained.



cally every hydrogen atom in it double the weight of ordinary hydrogen.

Prof. Harold C. Urey, Columbia University chemist and one of the group that two years ago discovered the existence of deuterium or heavy hydrogen, described the production of heavy water on a scale and at a low cost hitherto unattained.

Water particularly rich in heavy hydrogen is obtained from a commercial water electrolysis plant and concentration is effected in a laboratory plant that produced eight to ten grams (approximately one-third ounce) per day. The production cost is about \$15 a gram, which is about a tenth of the costs reported from other laboratories.

The heavy weight isotope of hydrogen should be christened "bar-hydrogen," Prof. R. W. Wood of Johns Hopkins suggests in a letter to *Science*.

The symbol would be H with a bar above it, if Prof. Wood's suggestion were adopted, and compounds would be called bar-benzol, bar-ammonia, etc. Deuterium which has been suggested as the name of the double-weight hydrogen suggests a new element rather than an isotope, in Prof. Wood's opinion.

*Science News Letter, December 16, 1933*

#### GENETICS

### Resistance To Disease May Be Inherited

**R**ESISTANCE to disease or susceptibility to it may be inherited. Proof of this appears in a study by Dr. Charles B. Davenport, director of the department of genetics of the Carnegie Institution of Washington.

Inefficient thyroid glands, for instance, tend to run in families, Dr. Davenport found in a study of goiter in a mountain valley of Western Maryland. While all the population there ate essentially the same food and drank essentially the same water, which was poor in iodine, the majority of the population did not have goiters, although lack of iodine is a factor causing goiter.

However, many of the people do have goiters and studies of their relationship showed that the goiters appeared only in certain families.

"One reaches the conclusion, then, that there are strains in the valley characterized by inefficient thyroids—in-capable, at least, of functioning normally when there is but a very small amount of iodine in the water," Dr. Davenport said.

*Science News Letter, December 16, 1933*

#### CRIMINOLOGY

## New Paraffin Test To Detect Hand That Fired Gun

**T**HE "PARAFFIN test," a chemical means of detecting the guilty hand which fired a revolver or pistol in the commission of a crime, has been officially adopted as a standard crime detection method, it was announced at Los Angeles, by Frank Gompert, criminologist of the county sheriff's office.

Based upon chemical research, the test, according to Mr. Gompert, fundamentally consists of nothing more than the color reaction of a solution of sulfuric acid and dythenylamine to the nitrates and nitrites which are the combustion products of gunpowder.

These chemicals are deposited in very small quantities on the hand of a person who fires a revolver or pistol by the gases which escape either from the cylinder of a revolver or the ejection mechanism of an automatic pistol, Mr. Gompert says.

The test was developed independently and apparently simultaneously by Dr. Fernandez Benitez, chief legal chemist of Havana, Cuba, and Prof. Benjamin Martinez of the Department of Identification and Criminal Research, Mexico City, and was first introduced into the

United States by Deputy Sheriff Ed Ayres of Los Angeles County.

Illustrating the use of the test, Mr. Gompert said:

"If a suspect is arrested either on the scene of a shooting or shortly after commission of a crime involving the use of firearms, his hands are painted with soft, melted paraffin of a bearable temperature in order to avoid placing the reagents directly on the skin and also that the resulting 'cast' may be of permanence for court and other purposes.

"After the paraffin has hardened, it is removed with tweezers, carrying with it the deposits made by the combustion gases. This cast is then treated with the solution.

"If the suspect had nitric or nitrous substances on his hands, deep purple splotches will appear on the wax and we have a positive result," says the criminologist.

"A mere positive result does not mean, however," he adds, "that we have proof that the suspect is guilty of the crime for there is no infallible road to crime detection any more than there is a royal road to learning.



**MAKING THE PARAFFIN TEST**

*Criminologist Gompert peels hardened paraffin from the hand of Deputy Sheriff Ayres. It will be tested with a chemical solution for tell-tale purple stains.*

"We must remember, in justice to the suspect, that he might possibly be a laboratory employe, a pharmacist or a farmer who has been handling fertilizer and therefore accumulated chemical deposits on his hands similar to those made by gunpowder gases and yet be utterly innocent of guilt."

The efficiency of the test depends, as in so many other fields of investigation, upon the proper interpretation of results, Mr. Gompert warned.

"We soon discovered that the gunpowder nitrates were deposited in very minute quantities over the back and upper part of the hand in a sort of 'peppered pattern,' he said.

A total of 234 tests of the method gave positive results in every case, Mr. Gompert claims.

The method is not in general use by police departments throughout the country, and, so far, other criminologists have not confirmed the results obtained in Los Angeles. If the method proves to be successful, even for the detection of murders planned so as to look like suicide, it will be of great service to crime detection officers.

*Science News Letter, December 16, 1933*

#### SEISMOLOGY

### Radio Timing Aids Earthquake Study

**R**ADIO time signals from a powerful central station enable seven seismological observatories in southern California to work as one, thus clocking very accurately the rate of travel of earthquake waves. This is one of the modern refinements in earthquake study now being conducted at the California Institute of Technology, at Pasadena, as described by Dr. Harry O. Wood of the Carnegie Institution of Washington, which cooperates in the research, along with the U. S. Coast and Geodetic Survey and other organizations.

California, being a land of many geologic "faults" or slip-lines in the rocks, is also a land of many earthquakes, most of them small, a few of them great. For this reason it has been selected as a favorable huge-scale laboratory for intensive seismological study.

Many of the seismographs used in this study are of a type designed especially for the recording of the less intense "local" quakes, as distinguished from the long-range instruments that catch the waves from "world-shakers" that occur in distant lands.

*Science News Letter, December 16, 1933*

#### ARCHAEOLOGY

## Secrets of American History Sought to Aid Unemployed

**Civil Works Funds Will Employ 1,000 Men at Five Sites; Recent Public Works Grants Aid Other Fields of Research**

**A** THOUSAND unemployed men will soon be disinterring secrets of aboriginal history in five different states. A new Federal Civil Works project approved by Harry L. Hopkins, Federal Civil Works Administrator, thus provides unexpected opportunities for scientific excavation on a large scale. All but one of the sites to be excavated are in the South, in Florida, Georgia, North Carolina and Tennessee. One is in California.

The sites to be explored are selected by the Smithsonian Institution, and are important to an understanding of America's ancient history. Heretofore, they have been considered projects too large to be undertaken by the Institution.

Scientists who will direct the work have been tentatively selected.

Reconstructing the lost story of what happened in Southeastern United States in the days before Columbus will be speeded by this new research in that section. Matthew W. Stirling, chief of the Bureau of American Ethnology, points out that not long ago the ancient story of the American Southwest was as confusing as that of the Southeast seems today. But today, through systematized research, the story of the Southwest is told in remarkable detail from a time before the Christian era down to the Spanish conquest.

#### Amazing Earthworks

One site in Florida, where 229 men will be put to work, consists of a system of prehistoric earthworks built by unknown Indians who lived in the Everglades before the Seminoles came there. These elaborate earthworks were discovered two years ago by Mr. Stirling. So great was the pattern of earthen ridges that he declared it amazing that no one had previously reported their existence.

Mr. Stirling will supervise the exploration of this important site near Lake Okeechobee to see what may lie buried there. He may also supervise excavation at the other two sites where work is to be done in Florida, one in

Brevard County, the other in Manatee.

In Georgia, Dr. Arthur Kelly, formerly of the University of Illinois, will direct the project of exploring the contents of a large mound in the city limits of Macon. The site, believed to be an old Hitchiti village, will call for 205 excavators.

In North Carolina, 104 men will explore a large mound near Murphy, believed to be the old Cherokee village of Guasili visited by the Spanish explorer De Soto. William B. Colburn from the University Museums, Ann Arbor, Michigan, will direct this project.

In Tennessee, Dr. Frank H. H. Roberts, Jr., of the Smithsonian will take charge of a project to excavate and restore Indian mounds in Shiloh National Military Park. The identity of the Indians who built these prehistoric mounds, and the age to which they belonged, have never been discovered.

California, the fifth state chosen for the research, will have 208 men at work opening up the Yokut Indian mound near Taft, in Kern County. Dr. William D. Strong of the Smithsonian is expected to direct the project. The mound is one of the key sites in California's prehistory, with a story extending indefinitely back into the past.

#### Public Works Allotments

Among the Federal projects just approved by the Public Works Administration, five allotments indicate a recognition of the value of scientific research as part of the recovery program.

Two allotments were made to the National Planning Board. One of \$35,000 provides for a program to discover, correlate, and study the researches and surveys now being made throughout the country on such projects as natural resources, population distribution and trends, health problems, local planning, and any other field which has a direct bearing on national welfare.

A second allotment of \$250,000 to the National Planning Board is to stimulate the preparation of (Turn Page)

state, regional, local and city plans by sending technical advisers to visit the local communities.

The Bureau of Chemistry and Soils, U. S. Department of Agriculture, received \$70,000 for the construction of an industrial farm by-products laboratory at Ames, Iowa, where the state agricultural college and experiment station is located.

An experimental study of stream pollution in the upper Mississippi River is provided for by an allotment of \$15,000 to the U. S. Bureau of Fisheries. This Bureau also received \$127,300 for the survey and improvement of streams and lakes in various sections of the country and to provide a scientific basis for such operations.

*Science News Letter, December 16, 1933*

#### VETERINARY MEDICINE

### May Conquer Disease By Giving It To Young Animals

**D**ELIBERATELY exposing very young calves and colts to the bite of the tsetse fly, carrier of the devastating "nagana" disease of livestock, is suggested by Prof. Claus Schilling, director of the tropical division of the Robert Koch Institute of Berlin, as a means of bringing about immunity to later attacks.

Many years ago, Prof. Schilling called attention to the apparent immunity of the wild hoofed animals of Africa to this disease, which is one of the principal factors in preventing large-scale white settlement in the tsetse fly belt of that continent. He thought this might be due to the fact that the young, born where the flies could bite them very promptly, might contract mild cases which would result in the building up of a considerable degree of resistance.

It is difficult to carry on research on this disease in European laboratories, but recently Prof. Schilling has obtained results which appear to lend support to his earlier conclusions based on field work in Africa. Renewed research in the African fly belt has been made possible to him, states *Die Umschau*, and he is again beginning to test his theory under natural conditions.

Nagana disease is caused by a blood parasite which is quite similar to the causal organism of African sleeping sickness, an exceedingly serious human affliction much worse than the European sleeping sickness which recently broke out in several American cities.

*Science News Letter, December 16, 1933*

#### METEOROLOGY

## Maybe Grandpa Was Right About Old-Time Winters

**M**AYBE GRANDPA was right after all, about winters being so much colder and longer when he was a boy. Recent statistical studies by J. B. Kincer of the U. S. Weather Bureau lend support to the claim that winters have been growing milder during the past fifty or sixty years. Spring and fall weather also has averaged warmer during the same time.

"When we examine the winter temperature data for Washington, for example," said Mr. Kincer, "it is found that for the last 21 winters 18 have been warmer than normal; that every one of the last 13 have been mild, and that the warmest winter of record, going back considerably more than a century, was that of 1931-32. This is in marked contrast with 'Grand-dad's day,' say, for the 19 winters from that of 1854-55 to 1872-73, fourteen of which were colder than normal, with 1855-56 the coldest in more than 100 years.

"The record for New Haven, Conn., may be cited as another example. Here every one of the last 10 winters has averaged warmer than normal; also, 18 of the last 21, and 33 of the last 45. This record, by the way, goes back to near the close of the Revolutionary War. Farther west, we pick up, at random, the St. Louis record, which shows 13 of the last 15 winters with above normal temperature. These are typical of others over the central and northern portions of the United States east of the Rocky Mountains."

#### Warmth in St. Paul

In St. Paul, Minn., Mr. Kincer continued, more than 75 per cent. of the fall seasons for the last 43 years have been relatively warm, in contrast to the 37-year period from 1840 to 1876, inclusive, during which only 9 were warmer than normal. In Washington, only 3 of the 25 falls since 1907 have had below normal temperature, while 15 of the last 17 months, up to and including September, 1933, have had plus departures from normal.

Mr. Kincer stated, however, that the abnormally warm weather experienced in general for a long time past does not

mean that cold periods have been entirely absent.

"On the contrary, the records indicate that occasional brief spells of abnormally cool, or extremely cold, weather are characteristic of prevailingly high temperature trends," he said. "The cold winter of 1917-18 may be cited as an example, coming at a time when the long-time trend was running comparatively high and also the fact that the lowest official temperature of record for the United States—66 degrees below zero—occurred in Yellowstone National Park in February of the present year."

*Science News Letter, December 16, 1933*

#### PSYCHOLOGY

### Accidents Likely After "Moderate Drinking"

**B**EVERAGE alcohol is shown by the latest medical research and examination methods to be a more important factor in traffic accidents than has heretofore been assumed. This is indicated by tests on accident victims carried to the Maria Hospital of Stockholm, Sweden, for treatment.

Of 113 men injured in traffic accidents, 50 of them, or 44 per cent., were found to have alcohol in their blood. This means that they had been drinking alcohol within a few hours before the accident occurred. Not all of them had been drinking heavily, however. In about one third, alcohol was found in concentrations of less than one part of alcohol to one thousand of blood; two thirds had more than one part per thousand.

Scientists believe this finding to indicate that symptoms leading to danger of traffic accidents are likely to occur in the very early stages of intoxication, that is after the drinking of what usually is called a "very moderate amount."

The study was conducted by Drs. J. Hindmarsh and P. Linde, every case being personally examined by them. Their report will be published in the forthcoming issue of *Acta Chirurgica Scandinavica*, Swedish scientific journal.

*Science News Letter, December 16, 1933*





RAILROAD LAUNDRY: DAILY CAPACITY 650 TONS OF STONES

## ENGINEERING

## Five Miles of Roadbed Is Machine's Daily Wash

FOR ORDINARY folks one wash day a week may be enough, but on the railroad every day is wash day, especially during the summer and fall. The laundry work is done on a gigantic scale, with tons of stone passing through the washers instead of the linens and laces of the family.

On the railroad almost the whole ballasted roadbed is taken up periodically by gigantic machines, thoroughly cleaned and put down again with mechanical precision. This regular cleaning of the ballast gives resilience and strength to the track, eliminates objectionable dust and dirt on the trains, improves the riding qualities and adds to safety.

The Pennsylvania Railroad has been trying out an entirely new and improved type of mechanical ballast cleaner. The new machine, illustrated on this page, has a capacity for cleaning 650 tons of stone ballast an hour, enough to fill eleven large steel hopper cars. Five miles of single track can be cleaned in one working day, both sides being cleaned at the same time.

The main unit is a massive machine 65 feet long. The cleaning apparatus proper consists of two rectangular steel boxes, one on each side of the machine, which, when in operation, are swung out beside the track.

*Science News Letter, December 16, 1933*

## ZOOLOGY

## European Snail Species Introduced into Australia

SNAILS of the common European species known as dune snails have found their way into Western Australia, presumably by accidental introduction on the bodies of imported farm animals or in their fodder. Though relatively harmless in Europe, the snails are reported to be making themselves troublesome in Australian gardens, and may prove to be another of the introduced pests, like the European rabbit and the American prickly-pear cactus, from which the southern continent has had to suffer.

The introduction of the dune snail into its new habitat is reported to *Nature* by Guy C. Robson of the British Museum.

*Science News Letter, December 16, 1933*

## ASTRONOMY

## Earth-Like Life Possible On Venus and Mars Only

LIFE is more likely to exist on Venus than on Mars, if it is to be found on any planet besides the earth. Life in anything like the form we know it would be quite impossible on any but the three planets mentioned. These inferences may be drawn from facts presented by Dr. Walter S. Adams of the Mt. Wilson Observatory, in a lecture before the Carnegie Institution of Washington.

Life as a physical thing is first of all conditioned by the atmosphere, and to support life a planet must have a friendly atmosphere. Mercury, the little planet nearest the sun, apparently has no atmosphere at all: it was too little to hold one by the attraction of gravity. Besides, on its sunward side Mercury is terrifically hot—hot enough to melt lead.

At the other extreme are the huge outer planets, Jupiter, Saturn, Neptune and Pluto. The larger of these have very thick atmospheres, perhaps thousands of miles deep, held by the attraction of their great mass. But they are so far from the sun that they are perpetually cold, far too cold for the support of life.

Mars has an atmosphere, but because the mass of the planet is only about one-tenth that of the earth, this atmosphere is thin and meager. Few clouds

are ever seen in it, though the existence of what seem to be polar snow caps would hint at the presence of some water. No free oxygen, indispensable to life, has ever been detected on Mars by spectrographic studies. Finally, the thinness of the atmosphere can do little to mitigate the contrast between the heat of Martian noon and the freezing cold of Martian midnight. So if life exists there it must be of the most primitive and toughest type—possibly like the lichens of the earth.

Venus, blanketed in perpetual veils of clouds, may have oxygen below their level, though again the spectrographs have never proved its existence there. But with abundant water, and a rich atmosphere to modify the ardor of the sun, life may be possible on Venus.

The atmospheres of the planets are studied by analyzing the sunlight reflected from them with a spectrograph, and identifying the dark "absorption bands" characteristic of each element and chemical compound. Thus, such strange gases as methane and ammonia have been found in the atmospheres of the larger planets. Planetary temperatures are measured by focusing light from different parts of their surfaces, or from their entire areas, on extremely delicate electrical devices known as thermocouples.

*Science News Letter, December 16, 1933*

## PUBLIC HEALTH

## Tuberculosis In Girls Not Due To Social Fads

**T**HE HIGH death rate from tuberculosis among girls in the 10-19 year age group is not due to the way they dress or the dieting fad, but to the fact that girls in the adolescent period are physiologically more susceptible to tuberculosis than boys in the same group, stated Dr. Lloyd Arnold of the University of Illinois College of Medicine at a meeting of the Illinois State Nursing Association in Chicago.

Dr. Arnold exhibited charts showing that since 1870, when the first vital statistics in this country were collected, the peak age for deaths from tuberculosis among girls was in the 10-14 year group, and it has remained in the same group in every succeeding decade.

In 1870, there were 208 girls who died to each 100 boys in the group of children 10-14 years. Comparable figures were: 1880—230 girls; 1890—250 girls; 1900—257 girls; 1910—262 girls; 1920—255 girls.

*Science News Letter, December 16, 1933*

## NEUROLOGY

## Sleep, Known To All, Still a Mystery

**A**LTHOUGH you spend almost a third of your life in sleep, the problem of how sleep comes about is still a puzzle to the scientists who have given most thought to its solution, Dr. S. W. Ranson, professor of neurology and director of the Institute of Neurology, Northwestern University, said.

"Many theories have been advanced, but they are all unsatisfactory," he said. "It has been supposed that during activity fatigue substances are produced and accumulate in the blood and that these have a narcotic action on the brain. The accumulation of these substances would thus periodically induce sleep during which they would be excreted from the body thus allowing for the return of the waking state. But against this theory are the facts that sleep, as in an afternoon nap, may come when there is little fatigue, that extreme nervous fatigue often leads to insomnia, and that normal sleep, unlike ether narcosis, is easily interrupted by noise or other disturbances."

"Another theory, which at one time received considerable attention, is that during sleep the conduction pathways in

the nervous system are broken by the retraction of small contact points between the neurones which are the conducting units of which the nervous system is composed. If this occurred it would stop nervous activity just as effectively as pulling all the plugs from a switchboard would stop all communication over that telephone system. But there is no evidence that such retraction occurs."

Sleeping sickness, the disease affecting the patient with extreme drowsiness so that if not aroused he would sleep day and night, has been found to be accompanied by damage to a point in the midbrain near its junction with the forebrain. This region has a very important relation to the alternation of sleep and wakefulness, it has been found.

*Science News Letter, December 16, 1933*

## ORNITHOLOGY

## Poets' Favorite Birds Now In National Zoo

**B**IRDS known by name to everybody who has read English poetry or literature have taken up residence "in person" in the National Zoological Park, Washington. Director William M. Mann has secured a small collection of English birds, which includes lapwing and waxwing; four finches; goldfinch; chaffinch, bullfinch, and hawfinch; the European butcher-bird or shrike, enemy of the others; and most familiar and famous of all, the English robin, who "hides in a barn to keep himself warm" and is not at all the same bird as the larger, tawnier-breasted American robin.

The English robin is expected to receive a good deal of attention, not only from children who know it from the nursery rhyme, but from nostalgic Britons who may not have seen England for years. One such was found by keepers in the bird house before the red-breast's cage, talking gently to the "little chap"—quite disarmed of his traditional British reserve by the sight of a small bird from home.

In addition to the strictly British birds famed in English literature, there are two from the East, the bulbul and the shama thrush, which English men of letters have made known to the rest of the world.

Another new collection which Dr. Mann has started will be first-class typical specimens of the canary tribe.

*Science News Letter, December 16, 1933*

# IN SCIENCE

## TESTING MATERIALS

## Strength of Crates Tested By Tossing

See Front Cover

**A**N IMPORTANT phase of the work of the timber mechanics department of the U. S. Forest Products Laboratory at Madison, Wis., has been to perfect the designing and nailing of these boxes so that their durability is greater. Chemically treated nails and reinforcement by diagonal braces have given more rigidity to a crate than the use of a high-grade wood could.

"The mechanical baggage man" of the Forest Products Laboratory has given the technicians this information. This mechanical man is none other than a 14-foot hexagonal drum that revolves vertically. Inside, sharp edges of wood and metal project, so that with every revolution of the wheel, the box receives six meter-recorded bumps. In ten minutes the container receives all the hard knocks of a thousand mile journey by freight or express. Because of the effectiveness of the "baggage man," thirty-five industries have duplicated him.

*Science News Letter, December 16, 1933*

## ORNITHOLOGY

## Ptarmigan Increase in Alaska's National Park

**A**PHENOMENAL increase in ptarmigan in Mount McKinley National Park, Alaska, in the past four years is reported by Superintendent Harry J. Liek.

When Superintendent Liek first went to the park, in the winter of 1929, these interesting birds were rarely even sighted. For two years little increase was noted. Then, in the winter of 1931, small coveys were seen traveling through the park. Now they are everywhere by the thousands, and Mr. Liek reports that flocks of several hundred at headquarters are a common sight.

During the winter the ptarmigan in McKinley Park live entirely upon the buds of willows and birch trees.

*Science News Letter, December 16, 1933*



# EN FIELDS

## PALEONTOLOGY

### Beavers As Big As Bears Once Lived in America

**A**BOUT a million years ago the North American continent was inhabited by beavers as large as black bears. From this huge stature they varied in size to that of a California ground squirrel or muskrat.

This is the picture of the past as drawn by R. A. Stirton, curator of the museum of paleontology at the University of California, as the result of a three-year study of fossil beavers from the Tertiary and Pleistocene geologic ages. Thirty-four species were studied, which range back into the Tertiary period, approximately 40,000,000 years ago. Of these twenty occur in North America.

*Science News Letter, December 16, 1933*

## ANTHROPOLOGY

### Earliest Human Beings Not All Cave Dwellers

**S**TONE AGE man was not necessarily a cave man.

Doubt is cast on the prevalent conception that all our hairy, club-wielding grandsires and great-uncles had "walk-ups" in caverns, by Dr. Ales Hrdlicka of the U. S. National Museum, who has made an analysis of 360 sites in Europe and Asia where human remains or stone implements of Old Stone Age date have been discovered.

The earliest evidences of human activity, Dr. Hrdlicka finds, were found predominately in open sites, away from caves. As time went on, and the climate grew colder with the coming of the last great advance of the Ice Age glaciers, man took more and more to the caves, finally emerging into the open again, this time as a house-builder, with the coming of the New Stone Age.

Thus, during the remotest and crudest culture periods, the Chellean of approximately 200,000 years ago, the presence of man is evidenced only by crude stone artifacts, and out of 94 places where these have been found

only two are caves. Then comes the Acheulian, dating approximately from 150,000 to 100,000 B. C. Only 10 out of 46 identified sites are in caves.

With the coming of the Neanderthaler during the next state of prehistory—the Mousterian—the practice of cave-dwelling became considerably more widespread, but man still clung to the open. Sixty-six per cent. of the known Mousterian sites are caves.

From that point on there is a steady increase in the number of cave or rock shelter sites, until during the Azilian and Tardenoisian eras, about 10,000 years ago and just at the edge of the Old Stone Age, man seems to have been chiefly a cave dweller. Only ten per cent. of the sites found belonging to these periods are in the open.

*Science News Letter, December 16, 1933*

## OCEANOGRAPHY

### Rate of Light Absorption In Sea Water Measured

**G**REEN light is absorbed by the green waters of inshore arms of the sea less rapidly than either red or blue. This is indicated by results of experiments of Prof. C. L. Utterback of the University of Washington, and the late J. Watson Boyle, performed among a group of small islands near the entrance to Puget Sound and also off the coast of Alaska.

The light penetrating to various depths in the water was measured with a light-sensitive apparatus lowered into the sea and read by means of electrical instruments on the deck of a boat. The apparatus was fitted with three colored filters which could be rapidly changed by an electro-magnet while the instrument was still submerged. Thus red, green and blue light could be tested in quick succession.

The small absorption of green light by green water is only what might be logically expected, Prof. Utterback points out. Green water appears green to the eye because it partly reflects from its surface the green rays in sunlight, partly lets them sink in for a short distance and then sends them back out again. The results in the two groups of experiments confirm the reports of other workers who have tested light absorption in inshore waters.

Farther out at sea, where the water is blue, one might expect the absorption of the blue light to be the least, Prof. Utterback suggests.

*Science News Letter, December 16, 1933*

## SEISMOLOGY

### Deep-Seated Earthquake Located In Siberia

**Y**AKUTSK, in Siberia, was the nearest city to the epicenter of the Monday, December 4, earthquake, seismologists of the U. S. Coast and Geodetic Survey announced, after studying data gathered telegraphically by Science Service from four observatories. The approximate location of the epicenter was given as in latitude 63 degrees north, longitude 135 degrees east. This point is somewhat to the northeast of the city of Yakutsk, and east of the Lena River. The earthquake was deep-seated, the slip occurring some miles beneath the surface; but the shock was not severe enough to cause material damage, the scientists estimated.

Observatories supplying data to Science Service were those of the Jesuit Seismological Association at Georgetown University, Washington, D. C.; Fordham University, New York City, and St. Louis University, St. Louis, Mo., together with the station of the U. S. Coast and Geodetic Survey at Honolulu, Hawaii.

*Science News Letter, December 16, 1933*

## ARCHAEOLOGY

### Old Britons Were Cannibals, Archaeologist Discovers

**C**ANNIBALISM was a practice among the natives of Britain about the time the Romans came, is the discovery just reported by G. C. Dunning of the Society of Antiquaries.

Mr. Dunning found the evidence of human bones split for their marrow while he was excavating at Salmons-bury Camp near Bourton-on-the-Water, in Gloucestershire. About thirty of the split human bones, believed to be female bones, were unearthed.

Aside from their cannibalism, the Britons who lived at the site were considerably civilized, Mr. Dunning reported. The surprising feature is that the cannibalistic practices occurred within the Christian era, near the time when the Romans extended their conquest over the island.

A pike-head found near the junction of two well-known trout streams was also described. It shows that ancient fishermen used the stream long before its modern era of popularity.

*Science News Letter, December 16, 1933*

## OCEANOGRAPHY

# Food Locked Up Forever

## Atlantic Ocean Alone Has Stored Away From Plants and Animals 20,000 Times the World's Annual Wheat Crop

By DR. FRANK THONE

**W**ILL Old Ocean swallow all the food?

Is Father Neptune a miserly hoarder, locking up in his vast cupboard a gradually accumulating pile of potential meat and bread, so fixed that neither man nor beast nor fish nor plant can ever make use of it?

Will the sea, which many believe to be the original cradle of all life, eventually become the grave of all life?

Questions pointing in this direction are asked by August Krogh of Copenhagen, a noted physiologist who also has an interest in matters pertaining to the sea, as is proper in a descendant of Vikings. Dr. Krogh has cast his questions in physiological form, inquiring how much energy that can be used for the purpose of life is to be found in the ocean, and how large a fraction of that total is "unavailable"—locked up in such forms that living things cannot get hold of it.

The figures for the "lost" food in the ocean which Dr. Krogh has reached through experiment and calculation are astonishing, and may well be alarming. The Atlantic Ocean alone, he estimates, has the equivalent of 20,000 times the whole world's annual wheat crop locked up in dissolved foods which no known plant or animal life in the sea can make use of.

### No Difference With Depth

The method by which this astonishing total was reached shows an interesting combination of experimental ingenuity and sweeping imagination in the mind of the Danish scientist. First he analyzed samples of sea water from the Atlantic, until he found that their chemical makeup was very nearly uniform, no matter at what depth they were taken. That simplified matters considerably: he did not have to allow for depth changes in his later calculations.

Then he determined, by quite difficult chemical processes, how much nitrogen, or protein material, there was in a cubic meter of it. The total protein-

stuff in a cubic meter figured out, Dr. Krogh next subtracted all of it that was represented by animals and plants that could be strained out, ranging in size from microscopic one-celled creatures to good-sized fishes. He allowed also for such monsters as whales and sharks that are not found in any given average cubic meter of sea water. The difference between the total protein material and the "organized" protein in the organisms represented the life-stuff actually dissolved in the water, and, for the time being at least, not in use by anything or anybody. This figured out as 1.5 grams (about 1/20 of an ounce) to a cubic meter.

### Very Thin Soup

By a similar process, Dr. Krogh determined that the average amount of carbohydrate in ocean water is 3.9 grams (about 2/15 of an ounce) to a cubic meter. If we figure protein as meat and carbohydrate as potato—really a pretty close representation of their chemical nature, at that—it becomes pretty obvious why the dissolved foods in the sea water are not being used. One-twentieth of an ounce of meat and two-fifteenths of an ounce of potato in over a cubic yard of water make a mighty thin soup. Not much nourishment in it for anybody, even a germ.

But there is a most appalling quantity of that thin soup. The Atlantic Ocean alone has an area of about 90,000,000 square kilometers, or 35,000,000 square miles. Its mean depth is 4,000 meters, or roughly 13,000 feet. Put that through your calculating machine, and you come out with something like a quadrillion cubic meters. All that cold salt water holding dissolved, in each cubic meter, a nibble of meat, a small bite of potato! Not remarkable, then, that the old Atlantic has locked up in its meager cupboard the food-equivalent of 20,000 world wheat harvests! If you like to juggle with endless strings of ciphers, you might try adding in the much bigger Pacific and the rest of the oceans.

Is all this dissolved food actually

useless? Isn't there anything, any class of animals in the whole vast ocean, that can get some good out of it? The very notion of 20,000 wasted wheat harvests runs against the streak o' Scotch that is in even the least thrifty of us.

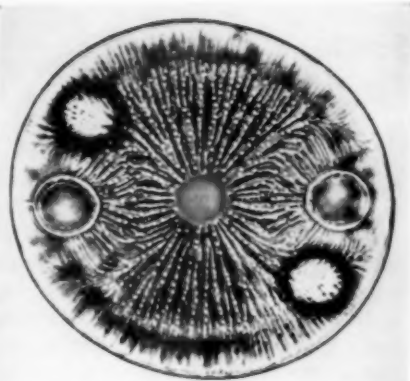
It doesn't look as though there were. Other scientists besides Dr. Krogh have puzzled their heads over that problem of the apparent awful waste of the ocean, and some of them have suggested various types of animal life—protozoa, sponges, even fishes—as able to soak up their nourishment directly out of the dissolved foodstuffs.

### Can't Eat Enough

Dr. Krogh will not commit himself dogmatically to a declaration that they can't. But he remains skeptical. Some experiments of his own have indicated that certain forms of water life can take up dissolved foods directly from the water; but they also threw in a joker; the same animals lost food materials to the water faster than they took food out.

The main difficulty seems to be in the extreme thinness of the soup on which such hypothetical direct-absorbing creatures would have to nourish themselves, and that, in turn, becomes a question of the absorbing surface they can present. We ourselves, and the animals physiologically most like us, have a relatively limited area for absorbing food; the lining of the thirty-odd feet of our digestive tract. Down at the other end of the ladder of life, among the one-celled animals and plants, the absorbing area is much greater in ratio to the total body bulk, simply because of the smaller size. They absorb things, most of them, with the whole outside surface of their body, and the less the diameter, the greater the relative surface area.

You can demonstrate this seeming paradox in a very simple way. Cut a cube of potato, or cheese, or putty, an inch on a side. Total exterior surface, six square inches. Cut it in two: you have added two square inches of outer surface, without changing the original cubic inch of bulk. Split each of the halves: you have added four more square inches of surface, and the bulk still remains one cubic inch. The finer you cut the pieces, the faster their total



#### MAKE SEA GREEN

Here are two greatly magnified diatoms, the most numerous drifting plants of the sea. Where they become abundant they color the sea green. About 8,000 species have been discovered. Dr. Albert Mann of Carnegie Institution of Washington, who has studied these plants for many years, says that in variety and grace of form they surpass all other organisms and that hardly a known shape that combines grace of outline and symmetry of parts appears to be unrepresented by some diatom.

surface grows. If you could carry your sectioning down to germ-sized pieces, the total area of outer surface would be many square yards.

So one-celled organisms would seem to be the most hopeful candidates for the eating of the ocean's over-thin soup. But even they decline, apparently. The one-celled animals seem to feed on nothing but the tiny plant life that swarms at the surface and in the upper layers where sunlight penetrates. Bacteria have been suggested. But the ocean seems to be almost barren of bacteria, and the ones that have been found are most numerous near the surface and in the neighborhood of the larger plants which yield a higher concentration of foodstuffs.

No; so far as there is any present positive evidence, nobody wants the ocean's thin soup. The 20,000 wheat

harvests must continue to lie in the cold kettle of the Atlantic, and no one knows how much more in the other oceans, for sheer want of a taker.

What is the source of this vast store of "lost" food? Where does it come from—how is it made?

#### Shallow Waters Favored

For the most part it is made in the ocean itself, and by inhabitants of the ocean. It is the product of minute plants that float in the sunlit water near the surface; for the most part the group of plants known as diatoms, "the grass of the sea." Where conditions are favorable for their growth they multiply rapidly and the water is thick with them, so that the sea is green. Blue, the natural color of sea water, betokens few diatoms, an empty sea, a desert sea. And a great part of any ocean looks back at the sky with this beautiful but empty blue.

In reckoning the life of the ocean, one should leave out of account the inshore waters and the shallow seas. These properly belong to the continents: they receive special gifts of minerals and organic debris from the rivers that flow into them, and they also offer foothold for bottom-anchored seaweed and various forms of animal life, so that shallow waters are always swarming alive.

But the open ocean is not thus dependent on the crusts that fall from the table of the land. Except for the mineral gifts from the land, via rivers, blown dust, and showers of ash from volcanic eruptions, the open ocean needs to thank the land for little. Its inhabitants make their own lives.

As deep into the ocean as sunlight can penetrate, plants live. Like land plants, the minute plants of the ocean, the diatoms, cannot live without light. With the aid of light, they, like land plants, take carbon dioxide and water and fashion them into food: carbohydrates first, the energy foods, then with the addition of nitrogen the proteins, the muscle foods. This food-making activity of plants is basic, indispensable, in the cycle of life whether on land or in the ocean; for animals cannot make their own foods but must eat plants, or other animals that have first eaten the plants, in order to live.

This plant life in the ocean swarms thickest near the surface. Usually the greatest numbers of diatoms are right at the surface, where the sunlight is strongest, but sometimes in the tropics the greatest density of plant life will

be at a little depth. Possibly this is because there the sunlight is a bit too strong; but nobody really knows the answer to that one yet. Anyway, the top 600 feet or so of the water contains practically all the plant life of the ocean, and the next 600 feet below that contains all the rest. Below about 1200 feet no sunlight penetrates, hence no plant can live and make food.

It is interesting to note that practically all the plant life of the open ocean is one-celled, microscopic. Nothing anywhere near as big as a tree, practically nothing as big as a clump of grass. Why?

There are several answers, probably all of them figuring to some extent in the complete answer. First, the ceaseless motion of the waves and currents would not permit the growth of large plants; they would tear them to pieces, as they often do tear to pieces the large seaweeds that grow near shore. Then there is that absorption-surface advantage that goes with small size. The mineral nutrients that all plants need, phosphates, nitrates, potash and the rest, are in much weaker concentration in the ocean than they are in the soil on land, so that big absorbing surface relative to total is necessary. The little fellow can live best on a thin diet.

#### Advantage of Smallness

Another advantage that small size gives the diatom, in Dr. Krogh's opinion, is that it slows down their rate of sinking. These tiny plants have no aids to flotation that we know about. As soon as they come into existence they begin to sink. But since they are so small the water offers more resistance to their sinking, and they can stay in the all-necessary sunlight near the surface long enough to carry on their part in the food-making cycle.

All these tiny plants are fed upon by all manner of almost equally tiny animals, both while they are at the surface and while they slowly sink down toward the everlasting dark in the abysses. Most of these animals are one-celled like themselves—they are the protozoa. But there are also swarms of others, some of them barely visible to the naked eye, some still microscopic, that are more complex. Many of these are minute relatives of crabs and lobsters. These feed alike on the plants and on the protozoa, and in their turn become the prey of larger animals of their own kind or of small fishes. Larger fishes eat them, and are themselves eaten by still larger ones, or by



the giant squid that the sperm whales feed upon. It is an endless cycle of eating and being eaten.

Dr. Krogh points out that this necessary "stepping up" of the food cycle in the ocean is much more wasteful than is the corresponding process on land, where any plant-eating animal, even an elephant, can make direct use of the vegetation. But there is no escaping it in the sea, where the basic plants are so small that only tiny animals can find them.

Down through this zone of ceaseless kill-and-be-killed drift the diatoms as they grow older. If they are not eaten, they dissolve. Their life-stuff, their protoplasm, dies and filters out through their hard silica shells, their stored food-reserve of oil is dissipated, at last even the silica shells dissolve in the all-claiming sea. The dead diatom has contributed its bit to the ocean's vast kettle of inedibly thin soup.

*Science News Letter, December 16, 1933*

#### MEDICINE

## Diabetes Increase Not Caused By Greater Sugar Consumption

**T**HE INCREASED diabetes death rate is not due to an increased per capita consumption of sugar, nor to changes in the national diet or living habits, in the opinion of Dr. Charles Bolduan, director of health education, of the New York City Department of Health.

In fact, the increase in the diabetes death rate is more apparent than real, Dr. Bolduan believes. He set forth his views to the American Public Health Association.

Fifty or sixty years ago diabetes was considered a rare disease. Dr. Bolduan has concluded that it was no more rare fifty years ago than it is today, but that fewer cases were detected, chiefly because simple tests for the disease were not available and no routine examinations for diabetes were made.

The disease was once considered more prevalent among men, but Dr. Bolduan believes that this was because routine tests in the course of examination for insurance and for industrial employment were made much more frequently among men than women until recent years. With the increased number of women in industry and also an increased number of women carrying life insurance policies, tests for diabetes are made among many more women now and consequently more cases are being discovered. The result is an apparent increase in number of cases among women, Dr. Bolduan explained.

Much of the increase in deaths recorded from diabetes is fictitious, Dr. Bolduan said, for many of the deaths represent merely the death of a diabetic individual from some other cause. It

seems that when a person who has had diabetes dies, the death is officially registered under diabetes. If there were other causes, they were mentioned secondarily, but the result is a swelling of the diabetes death lists.

Diabetes develops most commonly after middle life. The aging of the population, because of a declining birth rate and cessation of immigration, has a marked influence in increasing the prevalence of the disease. Likewise, in New York City the relative increase in the Jewish population has led to an increased prevalence of the disease in the city, because the disease occurs much oftener among Jews than non-Jews, a health department survey showed.

Diabetes is more prevalent than is generally believed. No one knows exactly how many cases there are in the country because it is not reported like communicable diseases such as smallpox, typhoid fever, etc.

As to the increase of diabetes being charged to increased eating of sugar or marked change in the relation between the expenditure of physical energy and food intake, Dr. Bolduan does not see why these factors should affect the death rate of women exclusively. When allowance is made for the aging of the population, the increase is seen to be limited to diabetes deaths in women.

*Science News Letter, December 16, 1933*

Germany, homeland of the Pied Piper, is arranging to have extermination of vermin handled by scientists instead of pseudo-professionals who it is claimed do not sufficiently protect the public against accident and deception.

#### GENERAL SCIENCE

## Smithsonian Institution Benefits By Patent

**U**NSELFISHLY sacrificing his chance for personal profit in the interest of the advancement of science, Dr. Adolph M. Hanson of Faribault, Minn., has assigned to the Smithsonian Institution all income and royalties accruing to him from his process of extracting the active principle of the parathyroid gland, on which he has recently been granted a patent. The announcement of Dr. Hanson's benefaction to the Smithsonian Institution is made by Dr. Oliver Kamm in *Science*.

Dr. Hanson conducted the research leading to his discovery in the few spare moments allowed him by an active medical practice. He completed the work several years ago, but litigation to clear up conflicting claims has delayed the issue of the patent until quite recently. The parathyroid principle, which has important uses in medicine, is now being manufactured according to the Hanson process by three large pharmaceutical firms.

Dr. Hanson's benefaction is to be known as the Martin Gustav and Caroline Runice Hanson Fund.

*Science News Letter, December 16, 1933*

#### PHYSIOLOGY

## Doctors Report Progress With Weight-Reducing Drug

**E**NCOURAGING results with the new weight-reducing drug which enables fat persons to lose weight while eating an ordinary diet have been obtained by Prof. E. C. Dodds of the Courtauld Institute and Dr. J. D. Robertson of the

### THE HUMAN-ANIMAL DISEASES

an address by

Dean D. J. Davis

—of the University of Illinois College of Medicine

Wednesday, December 20, at 4:35 p. m., Eastern Standard Time, over Stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.



Middlesex Hospital, London. The results are announced in *The Lancet*.

The new weight-reducing drug has the chemical name of dinitro-ortho-cresol and is said to be five times more powerful than dinitrophenol, which American physicians have been trying out clinically.

Both drugs act to cause weight reduction by speeding up the rate of metabolism, the process of tissue change constantly going on in the body and embracing the change of foodstuffs and tissue into energy for the body's use. When the metabolism is speeded up, the body uses up energy faster, calling on the reserve stores of fat to augment the daily food supply. As a result, weight is lost.

The thyroid gland is a regulator of the rate of this process, and when because of disease or some other condition, it fails to function normally and the rate is very much slowed up, the condition of myxedema results. Thyroid extract restores the rate to normal and relieves the symptoms. The new drug which stimulates metabolism also restores the lowered rate of myxedema patients to normal, but without relieving the patient of the other symptoms of the disease.

This suggests a new and interesting point: either the relief of myxedema is independent of the raised metabolic rate or else increase in metabolism induced by medication differs from normal metabolism.

Dinitrophenol is a very potent and dangerous substance, not to be used without a physician's direction. Deaths have already occurred from its indiscreet use. Dinitro-ortho-cresol is said to be safer than dinitrophenol, but it is not intended for use without medical guidance.

*Science News Letter, December 16, 1933*

#### MATHEMATICS

### Mathematicians Abandon Aristotle's Logic

THE PERSISTENCE of mathematicians in sticking to the Aristotelian laws of logic is an example of the "unscratchable stupidity of the human race," in the opinion of Dr. E. T. Bell, mathematician of the California Institute of Technology at Pasadena.

Mathematicians had been getting into trouble on account of following logic for thousands of years and they did not know what to do about it, Dr. Bell told

a meeting of Sigma Xi. A hundred years ago, an exactly analogous difficulty had been overcome in the field of geometry when Lobatchevsky, a Pole, first showed that a non-Euclidean geometry could be worked with complete satisfaction. Since then, infinitely many non-Euclidean geometries have been developed ignoring the famous "parallel postulate." Mathematicians all know about this, yet it was only three years ago that Lucasiewicz and Tarski, also Poles, had the sense and audacity likewise to ignore Aristotle.

Every intelligent and conscientious person has had difficulty answering the question: "Is this statement true or false?" The first improvement of the old logic was to show that one could allow, besides the answers "yes" and "no", the third answer "possibly," and still work out a complete system of in-

ference. In this sense, truth could be three-valued and still be logical. Then it was found by other workers that there could be any number of gradations of truth, even infinitely many.

These logics of "many-valued truths" are really closer to scientific matters than the true-false logic of Aristotle. In fact, the branch of mathematics which is most important in science, namely the theory of probability, has only now been put on a satisfactory basis by two Germans, von Mises and Reichenbach. There had been three hundred years of practically sterile discussions of this subject on the basis of the older logic, and meanwhile scientific workers could only hope that the imperfect theory of probability would not lead them astray. Of course, Dr. Bell said, it often did, but this will be less excusable in the future.

*Science News Letter, December 16, 1933*

As a Christmas or other friendly  
gift of remembrance:

## What to Give?

at \$3<sup>50</sup>

A one year subscription to Science News Letter if sent in with your own renewal.

at \$5

A one-year subscription to Science News Letter sent alone.

at \$7

A two-year subscription to Science News Letter or a one year gift plus your one year renewal.

Please use the Coupon below

To SCIENCE NEWS LETTER  
21st and Constitution Avenue,  
Washington, D. C.

Please enter the following

- ☐ 1 year Gift plus my own one year renewal.  
☐ 1 year subscription  
☐ 2 year subscription

I enclose remittance (or, bill me later):

GIFT TO

Name .....

Street Address .....

City and State .....

My Name and Address

My Name .....

Street Address .....

City and State .....

19124

## The SCIENCE REVIEW of 1933

—will be featured in the next  
issue of SCIENCE NEWS  
LETTER

**T**HIS ANNUAL summary of the outstanding achievements in all fields of science is being prepared more exhaustively this year than ever before. It is indispensable to a proper understanding of the thrilling scientific advance of 1933.

### PSYCHOLOGY

## Superior Rhythm of Negro Children Checked By Test

**A**NYONE who has ever watched a group of piccaninnies dancing to the strains of a street organ knows they have rhythm. That this is a racial trait and that the negro's rhythmic sense is really superior to the white man's seem now to have been corroborated by a scientific study.

The speed with which colored and white children learned to respond to the rhythmic four-four beat of a tom-tom drum was measured by Dorothy M. Muzzey of the Southern Illinois State Teachers College.

She found, as she had rather expected, that the negro children showed a superior sense of rhythm and learned the rhythm pattern faster than the white children. This and other interesting findings in the study, which was completed at the State University of Iowa, have been reported to the American Physical Education Association.

Fifty white and fifty colored children in the elementary grades from the second through the sixth were studied. The white children had a decided advantage over the colored in having had more training, both at school and outside, in music and rhythm.

For the study, the children were told to follow the rhythm of the tom-tom as closely as possible, tapping with one foot on a pedal in exact time with the sound of the drum. The rhythm of the drum and the children's responses were both recorded by a specially constructed machine and the records later studied.

"The interest of both white and colored children was very good throughout the experiment," reported Miss Muzzey. "The difference in the total reaction to the rhythm pattern of white and colored children was marked. During the experiment the white children stood quite still, moving only the foot on the pedal. They made no motor response other than the required steps.

"The colored children, on the contrary, had a definite tendency to sway forward and backward to the rhythm of the pattern. At times the entire body swayed; at other times only the head moved. One child used the toe of his left foot to syncopate, while with his

right foot he followed the beat of the tom-tom. Another child, acting the part of an imaginary drum major, used a small stick to keep time to the rhythm of the pattern."

Children in the higher grades showed a greater sense of rhythm and learned the pattern more quickly, the superiority progressing with each higher grade. In all the grades the colored children learned more quickly than the white children, but after attaining a certain degree of proficiency at responding to the pattern, progressed no further.

The white children, although learning more slowly, continued to improve in rhythmic response over a longer period, gradually gaining on the degree of proficiency of the colored children.

Miss Muzzey considers the more rapid initial learning of the colored race as being probably a reflection of greater interest in rhythmic activities, while the higher variability observed in the negro children may have been due to emotional instability.

*Science News Letter, December 16, 1933*

### PHYSICS—AGRICULTURE

## Ultraviolet Rays Detect Value of Farmers' Seed

**T**HE UNCANNY power of ultraviolet rays, to detect what is hidden from ordinary eyes, is now turned on the farmer's seed. Tests at Queens University, Belfast, show that ultraviolet light reveals differences in the grade of seed that are not shown up in ordinary light. The experiments were conducted by P. A. Lineham and S. P. Mercer.

Rye-grass seed used in the tests were found to be fluorescent when inferior in grade. The type which is superior for farming uses was found to be non-fluorescent. The two kinds of seed are usually mixed or hybridized in stocks of rye grass in planting for pasture.

The same test has also been applied to distinguish varieties of wheat and barley and to find the relative vitality of seed potatoes.

*Science News Letter, December 16, 1933*

More than fifty uses for corncoobs, once waste material, have been found.



# NATURE RAMBLINGS

by Frank Thone

ZOOLOGY



## Not a Good Neighbor

THE ancient and honorable seafaring nation of Norway was given a totally undeserved black eye when some one called the common brown rat the "Norway" rat. It did not originate in Norway; nobody knows where it did come from, but more than likely its first home was in some Bronze Age sink of iniquity east of Suez. Because of its skill as a stowaway it has travelled on man's ships wherever they have gone. And that means that it has travelled to Norway and on Norwegian vessels—for in what seas have not the Viking prows broken water?

This unwelcome shipmate and housemate of man survives because (little as we may like it) he is so much like man. He can live in the same quarters, or in corners of them, can feed on thievings and leavings of man's food, can survive practically any climate that man, the most versatile of mammals, can himself endure. The brown rat even seems to think more or less in human terms, for he can unpuzzle almost any trap of man's invention. And he breeds so rapidly that in spite of man and his poisons and machines and his dogs and cats and ferrets, and, in the tropics, his house-snakes, the rat still holds his own.

He is not only a nuisance and a thief but a menace to our lives. For the rat carries vermin that in turn carry the germs of the most dreaded of all epidemic scourges, bubonic plague. For this reason are we put to the work and expense of deratting ships in our seaports, and of putting rat guards on all lines and hawsers. No: the brown rat is no doubt permanently our neighbor, but we can never regard him as a good neighbor.

*Science News Letter, December 16, 1933*

## First Glances at New Books

Additional Reviews On Page 400

### Biology

**SEX DETERMINATION**—F. A. E. Crew—*Methuen, London, 138 p., 3s 6d.* This monograph presents briefly and clearly the essential facts on the subject, omitting, for reasons of space, discussion of the many theories of sex control. The glossary will make it possible for the non-scientific reader to glean much sound information from the text.

*Science News Letter, December 16, 1933*

### Nature Study

**THE CORNELL RURAL SCHOOL LEAFLET**, hitherto available only to rural schools in the State of New York, can now be had anywhere in the United States on a subscription basis: 50 cents for the four issues of the year, or 30 cents for the three children's numbers. This publication has a history of 26 years of successful use in classes of pre-college level. Subscriptions should be sent directly to The Cornell Rural School Leaflet, Cornell University, Ithaca, N. Y.

*Science News Letter, December 16, 1933*

### Paleontology

**AN INTRODUCTION TO THE STUDY OF FOSSILS**—H. W. Shimer—*Macmillan, xvii+496 p., \$4.* This textbook for beginners in paleontology and paleobotany will fill a long-felt need; for without question many teachers of geology have wanted something of this kind to offer students for whom the partial and usually disconnected treatment of the subject in general textbooks of geology has been insufficient, and the more special treatises sometimes a bit too advanced. The one criticism that might be offered applies to paleontology books in general: a rather disproportionately small section of the book (less than a fourth) devoted to plant fossils.

*Science News Letter, December 16, 1933*

### Geology—Physics

**SEISMOLOGY**—Subsidiary Committee on Seismology—*National Research Council, 223 p., paper \$2, cloth \$2.50.* Leading American seismologists join in an exhaustive treatment of various phases of this branch of geophysics. This volume is the sixth in a series of bulletins on the Physics of the Earth and it was prepared under the sponsorship of the National Research Council and the American Geophysical Union. Those contributing chapters are J. B. Macellwane, H. O. Wood, H. F. Reid, J. A. Anderson and P. Byerly.

*Science News Letter, December 16, 1933*

### Physics

**THE THEORY OF ATOMIC COLLISIONS**—N. F. Mott and H. S. W. Massey—*Oxford Univ. Press, 277 p., \$6.* Classical and quantum mechanics are applied to collisions between atoms, electrons and ions, which constitute an extremely important field of modern physical theory and experiment. Special attention is paid to collisions between particles moving with relatively small velocity. Phenomena where one of the colliding particles is a light quantum and problems involving a discussion of nuclear structure are not included within the scope of the volume. This is one of the international series of monographs on physics and the authors are at Cambridge University.

*Science News Letter, December 16, 1933*

### Astronomy

**PLANETARY THEORY**—E. W. Brown and C. A. Shook—*Cambridge Univ. Press, xii+299 p., \$4.75.* An exhaustive examination of mathematical methods for the calculation of the action of one planet on another.

*Science News Letter, December 16, 1933*

### Mathematics

**NUMERICAL INTEGRATION OF DIFFERENTIAL EQUATIONS**—*National Research Council, 108 p., \$1.* This report consisting of chapters by Prof. Albert A. Bennett, William E. Milne and Harry Bateman is intended for the student desirous of learning the theory of numerical integration of differential equations and for the practical computer. It is the report of Committee on Numerical Integration of the National Research Council's Division of Physical Sciences.

*Science News Letter, December 16, 1933*

### Physics—Metallurgy

**CRYSTALLINE STRUCTURE IN RELATION TO FAILURE OF METALS—ESPECIALLY BY FATIGUE**—Herbert John Gough—*American Society for Testing Materials, 111 p., \$1.* The 1933 Edgar Marburg lecture delivered by the Superintendent of the Engineering Department of England's National Physical Laboratory.

*Science News Letter, December 16, 1933*

### Engineering

**INDEX TO PROCEEDINGS, HIGHWAY RESEARCH BOARD: VOLUMES 1-12 (1921-1932)**—Ed. by Roy W. Crum—*National Research Council, 108 p., \$1.50.*

*Science News Letter, December 16, 1933*

# ●First Glances at New Books

Additional Reviews  
On Page 399

## Education-Sociology

**ADULT EDUCATION AND THE SOCIAL SCENE**—Ruth Kotinsky—*Appleton-Century*, 208 p., \$2. The United States Government's great new project of adult education as a relief measure for the unemployed makes this volume of special timely interest. There is need for adult education, Prof. William H. Kirkpatrick emphasizes in his foreword. To quote him: "As never before in history, modern science presents us with new discoveries and inventions. The difference is epochal. Correlative changes in ways of living follow. Social life has probably changed more in a hundred years than in all historic time before put together. Social changes mean social problems."

*Science News Letter*, December 16, 1933

## Paleontology-Biography

**THE LIFE OF A FOSSIL HUNTER**—Charles H. Sternberg—*Jensen Print. Co., San Diego*, xiii+286 p., \$1.75. A professional collector of fossils in the West, grown old in harness, reminisces of the days when he worked with Cope, and of many interesting things he has seen since then.

*Science News Letter*, December 16, 1933

## Paleontology-Biography

**HUNTING DINOSAURS IN THE BAD LANDS OF THE RED DEER RIVER, ALBERTA, CANADA**—Charles H. Sternberg—*Author, San Diego*, xv+271 p., \$1.75. A sequel to the author's "Life of a Fossil Hunter," in which he adds to the tales of his adventures in collecting skeletal remains, mostly of dinosaurs, which have found places in many leading museums.

*Science News Letter*, December 16, 1933

## Protozoology

**STUDIES OF AMERICAN SPECIES OF FORAMINIFERA OF THE GENUS LEPIDOCYLINA**—Thomas Wayland Vaughan—*Smithsonian Institution*, 53 p., 32 pl., 50c.

*Science News Letter*, December 16, 1933

## Aesthetics—Mathematics

**AESTHETIC MEASURE**—George D. Birkhoff—*Harvard Univ. Press*, 226 p., \$7.50. The appreciation of works of art, of music, of poetry, depends upon an intuitive evaluation of the relation of the elements of form involved, and this relation can be expressed in mathematical formulae, the author holds. The application of these formulae in the experimental composition of music and

poetry, and tables giving the aesthetic measure of various forms as worked out mathematically, contribute to the interest of this original volume.

*Science News Letter*, December 16, 1933

## Medical History

**MYSTERY, MAGIC AND MEDICINE: THE RISE OF MEDICINE FROM SUPERSTITION TO SCIENCE**—Howard W. Haggard—*Doubleday, Doran*, 192 p., \$1. The compactness, vivid and highly readable style of writing, and splendid glossary of proper names and medical terms should make this history of medicine particularly attractive to the lay reader.

*Science News Letter*, December 16, 1933

## Child Health

**HEALTHY CHILDHOOD**—Harold C. Stuart—*Appleton-Century*, 393 p., \$2. Dr. Stuart has embodied in this book for parents much of the information assembled by the White House Conference on Child Health. The book is comprehensive, specific and simply written and should prove helpful to many parents and other persons without scientific training who are in charge of the care of children.

*Science News Letter*, December 16, 1933

## Chemistry-Physics

**HANDBOOK OF CHEMISTRY AND PHYSICS**—Charles D. Hodgman, Ed.-in-Chief—*Chemical Rubber Pub. Co.*, 1818 p., \$6. The eighteenth edition of this standard reference work makes its appearance. Among the innovations is a very useful table of photographic plate and film speeds.

*Science News Letter*, December 16, 1933

## Archaeology—Art

**ATTIC VASE-PAINTING**—Charles T. Seltman—*Harvard Univ. Press*, 97 p., 37 pl., \$1.50. In this third volume of the Martin Classical Lectures, Prof. Seltman traces the history of the vase painting art in Greece. Publication of the lectures with pictures of important vases offers the reader an opportunity to take a brief introductory course on one of the world's famous developments of the painter's art.

*Science News Letter*, December 16, 1933

## Zoology-Exploration

**THE FOREST OF ADVENTURE**—Raymond Ditmars—*Macmillan*, ix+260 p., 16 pl., \$2.50. A quasi-fictional account of thrilling doings in the jungle, written by one who hardly needs to gloss over his own Odyssey with fiction, except that it gives him greater freedom to arrange his events and order his climaxes to suit his pleasure, instead of just recording them as they happened. Those who know their Ditmars will not need to be urged to buy this book.

*Science News Letter*, December 16, 1933

## Chemistry

**THE CHEMICAL FORMULARY, VOL. I**—Ed. by H. Bennett—*Chemical Formulary Co., Brooklyn*, 537 p., \$6. Formulae of many chemical industries are given in a manner to be of chief interest to the chemist or chemical engineer seeking information about practices with which he may not be familiar. Laymen and those whose hobby is a home workshop will also find the book very useful. These are typical chapter headings: Beverages and Flavors; Cleaners, Soaps; Cosmetics; Explosives, Pyrotechnics, Matches; Fuels; Leather, Hides, Skins, Furs; Metals and Treatment; Plastics, Celluloid, Cellulose Esters, Compositions, Silk, Rayon, Cotton, Fibre; Water-proofing.

*Science News Letter*, December 16, 1933

## Geology

**CATALOGUE OF SMALL-SCALE GEOLOGIC MAPS (Preliminary Edition)**—Walter B. Bucher—*National Research Council*, 132 p., \$1. A detailed listing of all small-scale maps now in print for the whole North American area, including Central America and the West Indies. It should be invaluable to field workers, teachers and in general to all who use maps.

*Science News Letter*, December 16, 1933

## Oceanography

**STATION RECORDS OF THE FIRST JOHNSON-SMITHSONIAN DEEP-SEA EXPEDITION**—Paul Bartsch—*Smithsonian Institution*, 31p., 1 pl., 1 folded map, 15c.

*Science News Letter*, December 16, 1933

Science News Letter will secure for its subscribers any book or magazine in print which was published in the United States. Send check or money order to cover regular retail price (\$5 if price is unknown, change to be remitted) and we will pay postage in the U. S. When publications are free, send 10c for handling. Address Book Dept., Science News Letter, 21st and Constitution Ave., Washington, D. C.